Description

Radio remote control for issuing commands to a remotely controllable device

The invention relates to a radio remote control for issuing commands to a remotely controllable device in a wireless manner, said radio remote control allowing execution of an assignment mode before becoming operational, including a transmit/receive unit, a controller and at least one antenna, wherein after the assignment mode is triggered by the user, the radio range of the remote control is decreased so far that communication is only possible with a device which is immediately adjacent to the remote control, and a return to the standard range only takes place after assignment is complete.

Particularly stringent safety requirements are necessary in the case of remote controls or remote controllers, particularly for industrial or agricultural devices. The remote controls normally use a conventional radio standard, e.g. Bluetooth, wherein ranges up to 100 m are usual depending on the performance class.

In order to prevent unintentional assignment of a "wrong" device to a remote control during the assignment or reassignment, the prior art requires at least the input of a PIN code at the remote control in order to start the assignment or identification procedure. In the case of Bluetooth, this is described in "LMP Lager Tutorial", 3.1.2 Authentication, 3.1.3 Pairing (freely available on the www at http://203.147.194.107/infotooth/tutorial/lmp.asp), for example.

The input of a PIN code requires the presence of a (alpha)numeric keypad at the remote control. This requirement is contrary to the wish for simple operation via a keypad displaying as few symbols as possible, often only generally understandable symbols such as ↑ and ↓. However, if the triggering of the assignment mode is simplified, e.g. by omitting a PIN, there is an increased danger that a device which is situated within radio range is inadvertently assigned and subsequently started.

US 6 369 693 B1 shows a radio remote control of the type cited at the beginning, said radio remote control having a memory for storing protected data such as an identification code of the remote control, for example. A device can be assigned to the radio remote control on the basis of this code. Furthermore, the radio remote control can transmit control commands using a first power level to a device, e.g. a door lock of a vehicle or a TV device, and can also transfer the protected data using a second lower power level to the device.

WO 98/02860 shows an arrangement and a method for establishing a communication pair consisting of a transmitter and a receiver, wherein only a receiver which is physically arranged such that it is directly adjacent to the transmitter can communicate for the purposes of assigning a transmitter to a receiver.

The solutions disclosed in US 6 369 693 B1 and WO 98/02860 are disadvantageous primarily in that a user cannot be sure whether the assignment of the remote control to a specific device has been carried out successfully.

The invention addresses the problem of providing a radio remote control which allows reliable assignment to a device and is as simple as possible to operate.

In accordance with the invention, this problem is solved by optically and/or acoustically indicating the start of the assignment mode and/or its successful completion.

The solution according to the invention is characterized in that it is particularly simple and is optimally adapted to the actual conditions in industry and agriculture. The assignment process can be triggered by pressing a single key, for example, whereupon the assignment takes place e.g. on a remote control which is immediately adjacent to the device.

In practice, it is particularly advantageous if the radio range is decreased by reducing the transmission power. This also offers very high protection against unwanted "interception" of the transmitted signal.

Alternatively or additionally, it is also possible to decrease the radio range by reducing the receiver sensitivity, or to decrease the radio range by intervening in the antenna function.